

Managing strategic risk in large manufacturing firms: an exploratory investigation from Italy

Antonio Costantini, Filippo Zanin

University of Udine, Department of Economics and Statistics, Udine, Italy
antonio.costantini@uniud.it, filippo.zanin@uniud.it

Abstract

In an increasingly competitive environment the collection and use of relevant information about risk have gained prominence in supporting firms strategic choices. Literature on risk management and prescriptive models have proposed that firms can mitigate strategic risk by systematically identifying and assessing potential risk sources, providing the basis for effective countermeasures. The purpose of this study is to provide some descriptive insights into the practices of large manufacturing firms, focusing on the strategic risk identification stage and the use and importance of risk assessment techniques.

The study reports the results of an Italy-based survey investigation considering a sample of 61 large manufacturing firms (with a response rate of 34.1%). The respondents were mainly Chief Financial Officers (CFOs) and the number of surveyed firms reflects the exploratory nature of the study. Responses reveal that the majority of surveyed firms explicitly consider strategic risk in their risk management practices and are well aware of the importance of different risk sources (operations, asset impairment, market competition, and reputation) in the strategic risk identification stage. The results also indicate that quantitative techniques (both probabilistic and non-probabilistic) for strategic risk assessment purposes are commonly used by large firms explicitly considering strategic risk, although often in combination with qualitative assessments involving the use of risk maps. These survey results (that however need to be tested on a larger sample) suggest that what risk management literature posits about the identification and assessment of strategic risk broadly aligns with the responses of firms CFOs.

Introduction

In a dynamic environment characterized by increasing global competition, risk management as a formal practice is becoming a priority for firms (Bhimani & Bromwich, 2010). The use of risk management practices has moved from a narrow financial perspective to gain prominence as a substantial component of management control systems, which mainly concerns timely identification, assessment, and control of potential future events, helping firms to fill information gaps, reduce uncertainty and support decision-making (Subramaniam et al., 2011). In recent years, a number of combined factors have driven firms to consider risk holistically from an overall corporate perspective (enterprise risk management) instead of managing different risk sources individually in different departments (silo-based risk management).

Enterprise risk management (ERM) seeks to relate risk management to strategy and to the achievement of long run objectives, through an integration of risk management into the strategic planning and the decision process (Gatzert & Martin, 2015). Mikes (2009) highlights that under ERM firms are interested in connecting risk more carefully to high-level strategic choices. Actually, strategy is concerned with the direction and scope of a firm over the long term and is achieved

through strategic choices at different levels (corporate, business, operational). Strategic risk arises since all outcomes of strategic choices are affected by varying degrees of uncertainty (Allan & Beer, 2006). As such, risk and strategy are closely interlinked, and risk is a major concern when comparing the expected performance of different strategic choices (Johnson et al., 2005).

Firms are increasingly willing to take actions aimed at managing strategic risk based on stakeholders' risk appetite and expectations, by developing processes and investing more resources (Kaplan & Mikes, 2016). Risk management prescriptive frameworks (e.g. CoSO, 2004) and literature (e.g. Gates, 2006; Beasley & Frigo, 2007; Bromiley et al., 2016) have mostly adopted a rational perspective incorporating strategic risk into ERM, which can also be viewed as an organizational process with different stages shaping an idealized sequence which owes much to cybernetic control thinking (Power, 2007). This view emphasizes the importance of event identification and risk assessment as basic stages to prepare reporting and establish appropriate strategic risk controls. The aim of this study is to explore whether such emphasis holds in firms practice, since risk management approaches are still emerging with variety of implementations (Mikes & Kaplan, 2015). Particularly, the study focuses on the importance firms attribute to the sources of strategic risk in the event identification stage and on the reliance firms place on risk assessment (quantitative and qualitative) techniques to estimate probability of occurrence and financial impact of risk events. Two propositions are empirically assessed and findings are based on a questionnaire survey considering a sample of 61 large manufacturing firms in Italy. The number of surveyed firms reflects the exploratory nature of the investigation. The intent of the analysis departs from previous researches as it focuses on strategic risk as a specific type of risk and concentrates on risk identification and assessment as components of the "ERM mix" (Mikes & Kaplan, 2013; 2015), whereas most of the existing literature have tended to examine risk management at a high level of aggregation or as a one-dimensional variable (Paape & Speklè, 2012).

The paper includes the following sections: literature review (which is divided in three subsections); research method and data collection; results; discussion and conclusions.

Literature review

Strategic risk: a brief overview

Mikes and Kaplan (2013) propose that firms need to tailor their ERM processes to the types of risk they face. Particularly, they introduced a taxonomy comprising three risk types (categories), which differ according to risk sources, approaches for identification and assessment and degrees of controllability: preventable, strategic (strategy execution), and external risk. Preventable risk stems from routine operational breakdowns or from employees illegal, incorrect or inappropriate actions. Managers effort should seek to reduce as much as possible the incidence of these events. External risk arises from events that the company cannot influence. As such, they are unavoidable and impossible to predict, and the concern is about firm resilience after the events occurrence. In contrast, firms voluntarily take on strategic risk in order to generate superior returns. Managers can identify and influence both the likelihood and the impact of their strategic risk, but some residual risk will always remain (Mikes & Kaplan, 2015). As suggested by Bromiley et al. (2016), strategic risk can be viewed as the risk associated with strategic choices. Strategic choices are concerned with decisions at different levels to obtain competitive advantage (Johnson et al., 2005): at the corporate level the decisions are focused on the overall scope of the firm's activities, dealing with the allocation of resources among various businesses or divisions of a firm; at the business level, the decisions address how to compete successfully to satisfy the needs of customers and meet the economic expectations of stakeholders, dealing with competitive position issues; at the operational level the decisions deal with the actions within firm functions, and relate to deliver effectively the corporate and business level strategies in terms of resources, processes and people. Strategic risk may arise especially at corporate and business level (McConnell, 2012).

Risk is inherent in strategic choices, as they involve variability in firm performance. Actually, strategic choices are complex in nature, non-routine, involve several internal and external variables, create change, and are made in situation of uncertainty about the future (Johnson et al., 2005). Miller (1992) states that strategic choices “determine a firm’s exposure to uncertain environmental and organizational components that impact firm performance”. Baird and Thomas (1985) stress that in strategic choices “a condition of risk usually exists because these decisions, by definition, involve uncertain outcomes that in the long run are important to firm survival”.

Hence, the management of strategic risk is an area that deserves time and attention of the board of directors and managers. Indeed, as management evaluates various strategic choices designed to achieve performance goals, related risk across alternative choices should be considered in the evaluation process to determine whether for each alternative the expected returns balance the associated risk (Beasley & Frigo, 2007). According to Frigo and Anderson (2011), strategic risk management is “a process for identifying, assessing and managing risk anywhere in the strategy with the ultimate goal of protecting and creating shareholder value”. It copes with significant internal and external events, representing potential risk sources, which are inherent in strategic choices. Strategic risk management aims to anticipate these events, estimating their likely impact on financial results, in order to provide information supporting the ex-ante comparisons among alternative strategic choices and advising strategic decision-making (Johnson et al., 2005). The inability to respond to strategic risk may lead to a loss of the competitive advantage, along with industry evolution, hampering the achievement of strategic objectives (Porter, 1980).

Strategic risk management is part of ERM process (Bromiley et al., 2016), whose formal structure is generally shaped as cybernetic control system based on monitoring and feedback (Power, 2007). Although risk management practices can vary considerably across firms, ERM process typically comprises the following main stages (CoSO, 2004; Slywotzky & Drzik, 2005): event identification; risk assessment; a consideration of firm’s attitude and strategy in relation to its risk appetite; risk response (accept, avoid or mitigate risk) and control. Further, these stages are elements of the “ERM mix”, a set of fundamental risk management components that are design parameters of the process (Mikes & Kaplan, 2015).

The event identification stage: sources of strategic risk

Strategic risk management usually begins by identifying and assessing how a range of potential future events may impact strategy execution (Beasley & Frigo, 2007). The basic stage is event identification, which concerns the identification of the possible sources of strategic risk (Baird & Thomas, 1985; Slywotzky & Drzik, 2005). Event identification entails preparing and updating a list of potential events linked to strategic choices that could affect firm performance and the ability to achieve objectives (O’Donnell, 2005; Frigo & Anderson, 2011). **Specific techniques are available for firms to identify expected risk events (see IMA, 2007).** As Power (2007) suggests, the emphasis on event identification reflects “a climate of concern during the 1990s for risks which are not be easily captured and understood by conventional information systems, particularly operational and reputational risks”.

Simons (1998) defines sources of strategic risk as “an unexpected event or set of conditions that significantly reduces the ability of managers to implement their intended business strategy” and classifies them into four groups: operations risk, asset impairment risk, competitive risk, and reputation risk. Strategic choices can affect firm exposure to all these sources of risk. Operations risk is the result of a breakdown in a core operating, manufacturing, or processing capability, that becomes a strategic risk in the occurrence of a critical product or process failure. Asset impairment risk is linked to a loss of current value in balance sheet assets or intangible resources, limiting the possibility of future cash flows. Asset impairment can turn into a strategic risk for a firm “if there is deterioration in financial value, intellectual property rights, or physical condition of assets that are important for the implementation of strategy”. Competitive risk is linked to market rivalry and can emerge from changes in the competitive environment (e.g. the actions of competitors, changes in

regulation, shifts in customers needs or suppliers choices) that could weaken the firm's ability to differentiate its products or services and to remain profitable. Finally, reputation risk arises when the consequences of one or more of the aforementioned sources are extensive, affecting the overall consideration that stakeholders have of a firm. In particular, reputation risk "occurs when business problems or actions negatively affect customer perceptions of value in using the business's goods or services" (Simons, 1998). The survey conducted by Fatemi and Glaum (2000) among large German firms show that competitive risk, financial and operational risk were attached a high degree of relevance and were actively managed. Further, Colquitt et al. (1999) find that the integration of operational and non-operational risk in the risk management process is positively related to firm size. In addition, as firm size increases, "the scope of events threatening it is likely to differ in nature, timing, and extent" (Beasley et al., 2005). Based on these arguments, the following proposition is presented:

P1: Large firms attribute a high degree of importance to all sources of strategic risk.

The assessment of strategic risk

The identification of sources of strategic risk provides the basis for risk assessment (Baird & Thomas, 1985). Risk assessment is shaped by an a priori investigation (forecasting) of probability and impact of potential events on firm performance (Noy & Ellis, 2003). Firms may use quantitative or qualitative techniques (risk tools) to assess strategic risk, or a combination of both, and the information obtained can be included in reports directed to managers for comparing strategic choices and informing decision-making about possible risk responses.

Quantitative techniques (probabilistic or non-probabilistic) require numerical data (historical or simulated), either internally or externally collected, to generate quantified estimates of probability or impact of potential events on financial performance. In particular, probabilistic techniques estimate the probability and impact based on distributional assumptions of the behavior of events with different time horizons, while non-probabilistic techniques allow to quantify the impact, but without determining probability of event occurrence (CoSO, 2004). On the other hand, qualitative techniques involve the role of managerial judgement, experience and intuition (Mikes, 2009; Schroeder, 2014). Qualitative assessments may address the use of focus groups, individual self-assessment or subjective scoring methods and typically result in the construction of risk maps, which depict potential events within a Cartesian coordinate system and classify them along two axes representing probability and impact, often standardized in terms of high, medium or low (Jordan et al., 2013).

Some writings recommend the use of quantitative techniques where possible, as it enables more rigorous assessment, albeit recognizing the significance of qualitative techniques (CoSO, 2004; Slywotky & Drzik, 2005). In addition, firm size is positively related to sophisticated controls, such as the use of quantitative probabilistic risk assessment techniques (DeLoach, 2000), as larger firms have relative lower costs of information processing (Cadez & Guilding, 2008). However, the availability of accurate and pertinent data and the knowledge about risk sources are essential factors permitting the use of quantitative techniques. As data availability and collection about some sources of strategic risk are often difficult, or risk sources may not lend themselves to be quantified, firms usually rely on qualitative techniques as a substitute (Bromiley et al., 2016). Gates (2006), for example, finds a relatively higher use of qualitative techniques than probabilistic models. Importantly, Mikes (2009) notes that some sources of strategic risk (e.g. operational risk or financial impairment of strategic assets) are intrinsically susceptible of measurement by quantitative techniques, while other sources (e.g. reputation risk, or operational risks that materialize only rarely) are non-quantifiable and qualitative assessments are needed. Based on these arguments, the following proposition is presented:

P2: Large firms rely both on quantitative techniques and qualitative techniques for the assessment of strategic risk.

Research method and data collection

Data used in this study were collected in the first half of 2013, employing a web questionnaire survey. The questionnaire was designed to investigate the use of risk management practices considering only large manufacturing firms (firms with at least 500 employees), as a number of studies show that firm size is a significant determinant in the adoption of a risk management system (e.g. Beasley et al., 2005). An initial sample of 179 firms was randomly selected from a population of 479 large manufacturing firms included in the dataset obtained from the Italian Chambers of Commerce. First, a letter directed to the Chief Executive Officer (CEO) of the firms was sent to present the topic of the research and to ensure participation. 70 firms agreed to be surveyed. Then, an e-mail was sent to these firms enclosing the web link to the questionnaire. A total of 61 complete and usable questionnaires were returned, with a response rate of 34.1%. The respondents were mainly CFOs. In order to assess the possibility of non-response bias, we conducted a comparison of the profiles of respondents against the manufacturing sector of firms in the selected sample. This comparison showed that respondents are significantly similar to sampled firms with regard to sector. For the sample selection, we considered the hypothesis of missing-at-random.

The study employs the approach used by previous surveys, in which firms were asked to rate the perceived importance of different aspects of the risk management practices (e.g. Fatemi & Glaum, 2000; Bezzina et al., 2014). In order to explore the importance of strategic risk sources and risk assessment techniques, the study employs ordinal scores, considering the median as measure of central tendency and the inter-quartile range (IQR) as measure of variability. The range is also reported. To explore whether certain items (sources or techniques) were rated significantly higher or lower than others, the study used the Friedman test, a non-parametric statistical test that detects differences across mean ranks in related samples (Conover, 1980). Then, to determine which pairs of items significantly differ, a multiple comparisons post-hoc analysis (Wilcoxon signed ranks test) was carried out. In post-hoc analysis, the Bonferroni correction was applied to take into account the problem of multiple comparisons increasing the Type I error (the probability of obtaining by chance a significant difference when there is no true difference).

Results

To empirically assess P1, firms were first asked whether they focus on the different sources of strategic risk in the risk identification stage. This question allows to explore whether firms explicitly consider strategic risk in the risk management process to actively manage it. Sources of strategic risk were taken from Simons' framework (1998) and a brief description was provided in the questionnaire to aid interpretation. Then, firms were asked to rate the degree of the importance attached to each source of strategic risk on a Likert scale ranging from “1” (unimportant), to “5” (crucial). Table 1 suggests that the majority of large firms (approximately 65%) have an explicit consideration of strategic risk, as they focus on the sources of strategic risk in identifying potential risk events connected to strategic choices. Overall, 41 out of 61 firms formally consider at least one source of strategic risk in their risk management process, whereas the remaining 20 firms do not actively manage strategic risk.

Table 1 – Firms explicitly considering strategic risk sources

	No. of firms	%
Operations risk	39	63.9
Asset impairment risk	40	65.6
Competitive risk	40	65.6
Reputation risk	40	65.6

Table 2 focuses on the perceived importance of strategic risk sources, presenting summary statistics and tests output. The results shows that large firms judge all the strategic risk sources to be important. Indeed, all the sources have been rated high, and the median score is 4 for each one. Friedman test is not significant (p-value = 0.775), indicating that there are no overall differences among strategic risk sources as regards their importance in risk identification stage. Post-hoc analysis with multiple comparisons (Wilcoxon signed ranks test) strengthens the evidence that the importance of strategic risk sources do not significantly differ from each other (each source is marked by the letter “A” to indicate that there are no statistically significant differences).

Table 2 – The importance of strategic risk sources in the event identification stage

	Median	IQR	Range	Mean rank	Wilcoxon signed ranks test summary
Operations risk	4	3-4	2-5	2.50	A
Asset impairment risk	4	3-4	1-5	2.37	A
Competitive risk	4	3-4	2-5	2.66	A
Reputation risk	4	3-4	2-5	2.47	A

Friedman test: $\chi^2(3) = 1.108$, p-value = 0.775

Competitive risk and operations risk are found to be relevant, as in the survey by Fatemi and Glaum (2000). Further, the results indicate that reputation risk has become a notable concern. In global markets, the possibility or danger of losing reputation can threat firms in many ways, influencing competitiveness, the trust and loyalty of stakeholders and the financial performance. Events that can damage reputation need to be accurately managed. A new challenge for firms is linked to the rise of social media and immediate global communication as potential drivers of risk exposure. Actually, contents shared and diffused in social media may impact how firms are perceived in the marketplace and cannot be controlled in advance by firms (Aula, 2010).

To empirically test P2, which regards the assessment of strategic risk, we address the use and importance of a set of risk assessment techniques. The set of techniques was drawn from CoSO (2004), that is a widespread template (Power, 2009) including both quantitative (probabilistic and non-probabilistic) and qualitative. Quantitative probabilistic techniques are: Value-at-risk, Cash flow-at-risk, Earnings-at-risk and Loss distribution. Quantitative non-probabilistic techniques are sensitivity analysis and stress testing. Qualitative techniques are represented by risk maps, while scenario analysis and benchmarking can be classified as quantitative/qualitative (IMA, 2007). A brief description of each technique was provided in the questionnaire to help interpretation.

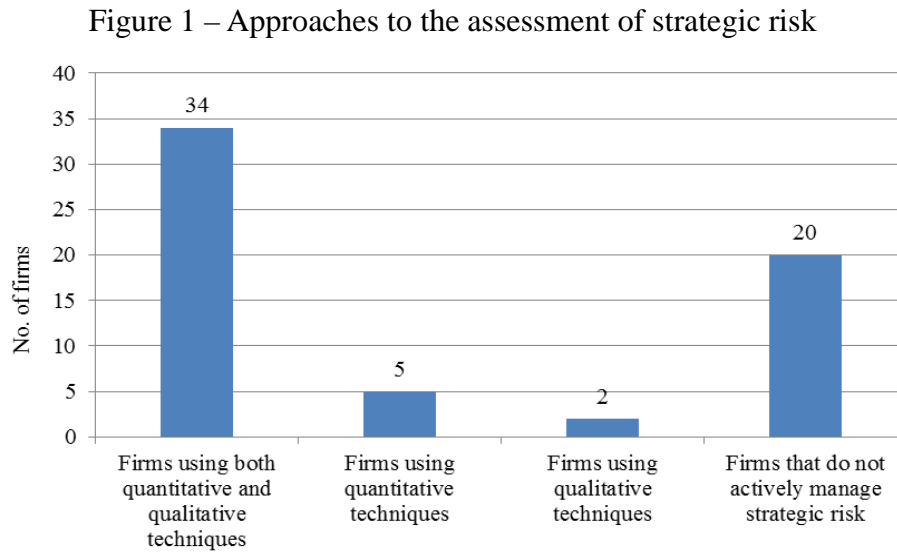
First, firms were first asked to indicate which techniques they use in assessing strategic risk. Table 3 shows that each technique is used by more than half of surveyed firms, without differences between quantitative and qualitative ones.

Table 3 – Techniques used for the assessment of strategic risk

	No. of firms	%
Cash flow-at-risk	38	62.3%
Value-at-risk	38	62.3%
Earnings-at-risk	36	59.0%
Sensitivity analysis	36	59.0%
Risk maps	36	59.0%
Scenario analysis	35	57.4%
Loss distribution	34	55.7%
Benchmarking	32	52.5%
Stress testing	32	52.5%

The techniques with higher incidence are “performance-at-risk” methods (Cash flow-at-risk and Value-at-risk), and this contrasts with the findings of Noy and Ellis (2003) and Gates (2006), who observed a limited use of probabilistic techniques for strategic risk assessment. These dissimilarities could be explained considering that the number of quantifiable and measurable risk sources has increased over time due to the significant advances in the risk measurement capabilities and technologies (Mikes, 2009). Another possible interpretation is that the use of quantitative techniques can contribute to perceived effectiveness of risk management (Paape & Speklè, 2012).

Further, Figure 1 points out that the majority of firms (34) use both quantitative and qualitative techniques for strategic risk assessment, while just few firms merely use either quantitative (5 firms) or qualitative ones (2 firms).



Then, firms were asked to rate the perceived importance of risk assessment techniques used on a Likert scale ranging from “1” (not important), to “5” (crucial). Table 4 reports summary statistics and tests output. Cash flow-at-risk emerges as the technique with the greater score (Median = 4, IQR = 3-5), followed by sensitivity analysis, scenario analysis and risk maps (Median = 3, IQR = 3-4). On the other hand, loss distribution have the lower score (Median = 2, IQR = 1-3). All the techniques, with the exception of loss distribution, tend to be attributed at least a moderate importance. In addition, Friedman test (p-value = 0.005) shows that the perceived importance of at least one of the techniques significantly differs from at least one of the others.

Table 4 - The importance of the techniques used for the assessment of strategic risk

	Median	IQR	Range	Mean rank	Wilcoxon signed ranks test summary
Cash flow-at-risk	4	3-5	1-5	6.54	A
Sensitivity analysis	3	3-4	1-5	5.72	A, B
Scenario analysis	3	3-4	1-5	5.32	A, B, C
Risk maps	3	3-4	1-5	5.28	A, B, C
Value-at-risk	3	2-4	1-5	4.84	A, B, C
Earnings-at-risk	3	2-4.75	1-5	4.48	A, B, C
Benchmarking	3	2-4	1-5	4.48	A, B, C
Stress testing	3	2-4	1-5	4.48	B, C
Loss distribution	2	1-3	1-5	3.94	C

Friedman test: $\chi^2(8) = 21.797$, p-value = 0.005

Wilcoxon signed ranks test was used to make pairwise comparisons and extend the results of Friedman test. Statistically significant differences in importance across risk assessment techniques at $p \leq 0.0014$ (after applying Bonferroni correction) are indicated by different letters. Pairwise comparisons have mostly revealed that no techniques were rated significantly higher than others, with the following exceptions: 1) cash flow-at-risk and sensitivity analysis are perceived to be more important than loss distribution in the assessment of strategic risk; 2) cash flow-at-risk is perceived to be more important than stress testing. Thus, cash flow-at-risk is indicated by the letter “A”, meaning a significant difference in perceived importance compared with techniques indicated by the letter “B” and “C”. Sensitivity analysis is indicated by the letters “A” and “B”, as its importance is significantly greater than that of loss distribution (which is indicated by the letter “C”). Particularly, according to these results, no significant differences are found in the importance between quantitative and qualitative techniques for the assessment of strategic risk.

Andrén et al. (2005) stressed that cash flow-at-risk is gaining popularity among non-financial firms as “it sums up all the company’s risk exposures in a single number that can be used to guide corporate risk management decisions”. Moreover, the importance of sensitivity analysis as risk assessment technique confirm the results of a UK-based study by Abdel-Kader and Dugdale (1998), who attributed its widespread use by large firms to its “simplicity and the availability of computer packages which can help in applying it in practice”.

In summary, the evidences provided in Figure 1, Table 3 and Table 4 indicate that surveyed firms tend to rely both on quantitative and qualitative techniques for the assessment of strategic risk. This could suggest, coherently with literature, that firms use different techniques when assessing probability and impact of different strategic risk sources (Gates, 2006), and that quantitative and qualitative techniques are complementary rather than alternative (Schroeder, 2014).

Discussion and conclusions

Risk management literature places emphasis on events identification and the use of risk assessment (quantitative and qualitative) techniques as fundamental components of risk management process. Focusing on strategic risk as a specific type of risk and by empirically assessing two propositions, the aim of this study was to explore whether firms explicitly consider the variety of sources of strategic risk in the event identification stage and whether firms rely on both quantitative and qualitative techniques in the assessment of strategic risk. Findings are based on a questionnaire survey involving a sample of 61 large manufacturing firms in Italy. Respondents were mainly CFOs.

The evidence provided here indicates that the majority of the responding firms explicitly consider potential sources of strategic risk in the event identification stage, and each source of strategic risk (operations, asset impairment, market competition, and reputation) is attributed a high degree of importance. According to Noy and Ellis (2003), these firms recognize the importance of risk as a major concern associated with strategic choices. Conversely, there is also a number of firms that do not engage in actively managing strategic risk.

The analysis on strategic risk assessment reports that the surveyed firms mostly tend to use both quantitative and qualitative techniques, which are considered equally important. This mainly suggests that both the output of quantitative models and managerial judgement involved in the use of risk maps can be bases for strategic decision-making, and that quantitative assessment cannot replace managerial judgement in comparing alternative strategic choices. As Kaplan and Mikes (2016) note, firms seem to “avoid the artificial choice between quantitative and qualitative risk management, allowing both to play important roles in identifying and assessing risks, and then in making decisions and allocating resources to mitigate the risks in a cost-efficient and moral manner”.

In summary, what risk management literature posits about the identification and assessment of strategic risk broadly aligns with the responses of large firms CFOs.

However, it has to be noted that while potential sources of strategic risk are highly considered in event identification stage, risk assessment techniques are deemed valuable to a moderate extent. This could be a signal of the difficulties inherent in estimating strategic risk. Otherwise, behavioural biases and organizational barriers may sometimes prevent the information obtained through risk assessment techniques from being acted on, and this could have an impact on the perceived importance of these techniques.

The study has a number of limitations, which should be considered in results interpretation. The main limitation concerns the number of the surveyed firms, that reflects the exploratory nature of the study. To increase the validity of the results and to help determine the extent to which they can be generalized, they need to be tested on a larger sample. Similarly, due to the sample size there is a possible non-response bias. The test performed to check this threat were negative but they do not consent to eliminate it. Further, the study focuses considers a cross-section of firms from a single country when comparisons over time as well as comparisons among firms from different countries would also be beneficial, due to the evolving nature of risk management and requirements of regulatory agencies that influence risk management practices. Yet, this study has focused on strategic risk only. It should be extended to other risk types (preventable or external) to provide a better comprehension of their identification and assessment and test whether the components of the “ERM mix” are dependent on risk types following a congruency perspective. Further research is also required to gain insights on the effectiveness of risk management practices.

References

- Abdel-Kader, M. G., & Dugdale, D. (1998). Investment in advanced manufacturing technology: A study of practice in large U.K. companies. *Management Accounting Research*, 9, 261-284.
- Allan, N., & Beer, L. (2006). *Strategic Risk: It's all in your head*. Working Paper Series, University of Bath, School of Management.
- Andrén, N., Jankensgård, H., & Oxelheim, L. (2005). Exposure-based Cash-Flow-at-Risk: An alternative to VaR for industrial companies. *Journal of Applied Corporate Finance*, 17(3), 76-86.
- Aula, P. (2010). Social media, reputation risk and ambient publicity management. *Strategy & Leadership*, 38(6), 43-49.
- Baird, I. S., & Thomas, H. (1985). Toward a contingency model of strategic risk taking. *The Academy of Management Review*, 10(2), 230-243.
- Beasley, M. S., Clune, R., & Hermanson, D. R. (2005). Enterprise risk management: An empirical analysis of factors associated with the extent of implementation. *Journal of Accounting and Public Policy*, 24(6), 521-531.
- Beasley, M. S., & Frigo, M. L. (2007). Strategic risk management: Creating and protecting value. *Strategic Finance*, May 2007, 25-31.
- Bezzina, F., Grima, S., & Mamo, J. (2014). Risk management practices adopted by financial firms in Malta. *Managerial Finance*, 40(6), 587-612.
- Bhimani, A. & Bromwich, M. (2010). *Management accounting: retrospect and prospect*. Oxford, UK: CIMA.
- Bromiley, P., Rau, D., & McShane, M. K. (2016). Can strategic risk management contribute to enterprise risk management? A strategic management perspective. In T. J. Andersen (Ed.), *The Routledge Companion to Strategic Risk Management* (pp. 140-156). New York, NY: Routledge.
- Cadez, S., & Guilding, C. (2008). An exploratory investigation of an integrated contingency model of strategic management accounting. *Accounting, Organizations and Society*, 33(7-8), 836-863.
- Colquitt, L. L., Hoyt, R. E., & Lee, R. B. (1999). Integrated risk management and the role of risk manager. *Risk Management and Insurance Review*, 2(3), 43-61.
- Conover, W. J. (1980). *Practical nonparametric statistics* (2nd ed.). New York, NY: Wiley.
- CoSO (2004). *Enterprise Risk Management – Integrated Framework*. New York, NY: Committee of the Sponsoring Organizations of the Treadway Commission.

- DeLoach, J. (2000). *Enterprise-wide Risk Management: Strategies for linking risk and opportunity*. London: Financial Times/Prentice Hall.
- Fatemi, A., & Glaum, M. (2000). Risk management practices of German firms. *Managerial Finance*, 26(3), 1-17.
- Friego, M. L., & Anderson, R. J. (2011). Strategic Risk Management: A foundation for improving Enterprise Risk Management and governance. *Journal of Corporate Accounting & Finance*, 22(3), 81-88.
- Gates, S. (2006). Incorporating strategic risk into Enterprise Risk Management: A survey of current corporate practice. *Journal of Applied Corporate Finance*, 18(4), 81-90.
- Gatzert, N., & Martin, M. (2015). Determinants and value of Enterprise Risk Management: Empirical evidence from the literature. *Risk Management and Insurance Review*, 18(1), 29-53.
- IMA (2007). *Enterprise Risk Management: Tools and techniques for effective implementation*. Montvale, NJ: Institute of Management Accountants.
- Johnson, G., Whittington, R., & Scholes, K. (2005). *Exploring corporate strategy* (Seventh ed.). Harlow, England: Pearson Education.
- Jordan, S., Jorgensen, L., & Mitterhofer, H. (2013). Performing risk and the project: Risk maps as mediating instruments. *Management Accounting Research*, 24(2), 156-174.
- Kaplan, R. S., & Mikes, A. (2016). Risk Management – the Revealing Hand. *Journal of Applied Corporate Finance*, 28(1), 8-18.
- McConnell, P. (2012). The governance of strategic risks in systemically important banks. *Journal of Risk Management in Financial Institutions*, 5(2), 128-142.
- Mikes, A. (2009). Risk management and calculative cultures. *Management Accounting Research*, 20, 18-40.
- Mikes, A., & Kaplan, R. S. (2013). *Managing risks: Towards a contingency theory of Enterprise Risk Management*. Working paper 13-063 (revised January 2014), Harvard Business School.
- Mikes, A., & Kaplan, R. S. (2015). When one size doesn't fit all: Evolving directions in the research and practice of Enterprise Risk Management. *Journal of Applied Corporate Finance*, 27(1), 37-40.
- Miller, K. D. (1992). A framework for integrated risk management in international business. *Journal of International Business Studies*, 23(2), 311-331.
- Noy, E., & Ellis, S. (2003). Risk: A neglected component of strategy formulation. *Journal of Managerial Psychology*, 18(7/8), 691-707.
- O'Donnell, E. (2005). Enterprise risk management: A systems-thinking framework for the event identification phase. *International Journal of Accounting Information Systems*, 6, 177-195.
- Paape, L., & Speklé, R. F. (2012). The adoption and design of Enterprise Risk Management practices: An empirical study. *European Accounting Review*, 21(3), 533-564.
- Porter, M. (1980). *Competitive strategy*. New York, NY: The Free Press.
- Power, M. (2007). *Organized uncertainty – Designing a world of risk management*. Oxford, UK: Oxford University Press.
- Power, M. (2009). The risk management of nothing. *Accounting, Organizations and Society*, 34, 849–855.
- Schroeder, H. (2014). An art and science approach to strategic risk management. *Strategic Direction*, 30(4), 28-30.
- Simons, R. (1998). *A note on identifying strategic risk*. Harvard Business School.
- Slywotzky, A., & Drzik, J. (2005). Countering the biggest risk of all. *Harvard Business Review*, 83(4), 78-88.
- Subramaniam, N., Collier, P., Phang, M., & Burke, G. (2011). The effects of perceived business uncertainty, external consultants and risk management on organisational outcomes. *Journal of Accounting & Organizational Change*, 7(2), 132-157.